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alighting rather suddenly upon the leaves, are taken easily, as they are not shy nor easily disturbed. This plant is very common in the pine woods; often in botanizing I have seen but few other plants, consequently the *Atala* would be very numerous. Often three or four occur on one plant. Their eggs, well-matured pupæ, cocoons and caterpillars, are found upon the same plant.

This plant is commonly called *Compte*, and the starch goes by that name, while the *Atala* butterfly is called "*Compte* Moth." The inhabitants readily recognize the caterpillars, as they and their parent are unlike any other of the butterflies of Biscayne Bay. Several chrysalides were placed in a box, part of them had nearly completed their transformation, others were not so advanced. The first hatched in five days, the others in seven days. Whether they would have hatched in that time if left upon the plant is more than I can tell. I noticed this insect feeding upon the banana leaves in the gardens, but upon no other plant did it seem to feed, other than its natural one, the *Zamia pumila*. — E. PALMER.

## ZOOLOGY.

ON AN UNDESCRIBED ORGAN IN *LIMULUS*, SUPPOSED TO BE RENAL IN ITS NATURE.<sup>1</sup>—In dissecting the king crab one's attention is directed to a large and apparently important gland, conspicuous from its bright red color contrasting with the dark masses of the liver and the yellowish ovary or greenish testes, and presenting the same appearance in either sex. The glands are bilaterally symmetrical, one situated on each side of the stomach and beginning of the intestine, and each entirely separate from its fellow. One of these glands consists of a stolon-like mass, running along close to the great collective vein, and attached to it by irregular bands of connective tissue, which also holds the gland in place. From this horizontal mass, four vertical branches arise, and lie between and next to the partitions at the base of the legs, dividing the sides of the body into compartments. The posterior of these four vertical lobes accompanies the middle hepatic vein from its origin from the great collective vein, and is sent off opposite the insertion of the fifth pair of feet. Half-way between the ori-

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<sup>1</sup> Read at the Philadelphia Meeting of the National Academy of Sciences, held in Nov., 1874.

gin of the vein and the articulation of the foot to the body, it turns at a right angle, the ends of the two other lobes passing a little beyond it, and ends in a blind sac, less vertical than the others, slightly ascending at the end, which lies just above the insertion of the second pair of feet. The two middle lobes are directed to the collective vein. Each lobe is flattened out somewhat and lies close to the posterior wall of the compartment in which it is situated, as if wedged in between the wall, and the muscles between it and the anterior portion of the compartment. Each lobe also accompanies the bases of the first four tegumentary nerves. I could not by injection of the gland, make out any general opening<sup>1</sup> into the cavity of the body or any connection with the hepatic or great collective vein; any attempts to inject the gland from the veins failing. The four lobes certainly end in blind sacs. The lobes are irregular in form, appearing as if twisted and knotted, and with sheets and bands of connective tissue forming the sheaths of the muscles among which the gland lies. Each lobe, when cut across, is oval, with a yellowish interior and a small central cavity, forming, evidently, an excretory duct. The gland externally is of a bright brick red. The glandular mass is quite dense, though yielding. It is singular that this conspicuous gland, though it must have engaged their attention, has not been noticed by Van der Hoeven, Owen or A. Milne-Edwards in their accounts of dissections of this animal.

When examined under a Hartnack's No. 9 immersion lens and Zentmayer's B eye piece, the reddish external cortical portion consists of closely aggregated irregularly rounded nucleated cells of quite unequal size, and scattered about in the interstices between the cells are dark reddish masses which give color to the gland. They are very irregular in size and form, and twenty hours after a portion of the parenchyma was submitted to microscopic examination vibrated to and fro. I am reminded in the vibrating movements of these bodies, of Siebold's (*Anatomy of the Invertebrates*) description of similar bodies in the renal organs of the Lamellibranchs, *i.e.*, the gland of Bojanus. He says in a foot-note, p. 214 (*Burnett's Translation*), "If the walls of these organs are prepared in any way for microscopic examin-

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<sup>1</sup> Leydig (*Naturgeschichte der Daphniden*) states that several anatomists, after laborious attempts, have failed to find the opening to the green gland in any crustacean.

ation, a part of their parenchyma separates into a vesiculo-granular mass, the particles of which have a very lively dancing motion. The motions are due to portions of ciliated epithelium adhering to the cells and granules."

In other portions of the outer reddish part of the gland, where the pigment (?) masses are wanting, the mass is made up of fine granular cells, not nucleated. Other cells have a large nucleus filled with granules and containing nucleoli.

In the yellowish, or, as we may for convenience call it, the medullary portion, are scattered about very sparingly what are probably the round secreting cells. The nucleus is very large and amber colored, with a clear nucleolus; others have no nucleolus, and the small ones are colorless.

I am at a loss to think what this gland with its active secreting cells, filled with a yellowish fluid, can be, unless it is renal in its nature. This view is borne out by the fact of its relation with the hepatic and great collective vein. If future examination shows some outlet into the venous circulation, then its renal nature would seem most probable. No other organ that can be renal in its nature exists in *Limulus*. In its general position and relations it is probably homologous with the green gland of the Decapod Crustacea, and its homologue in the lower orders of Crustacea, which is supposed also to be renal in its nature. It may also possibly represent the organ of Bojanus in the Mollusca, which is said to be renal in its function. It perhaps represents the glandular portion of the segmental organs in worms. That so large and important a gland is an embryonic gland, in adult life aborted and disused, is not probable, nor is there any good reason for regarding it as analogous to the suprarenal capsule of the vertebrates, analogues of which are said by Leydig to exist in *Paludina* and *Pontobdella*.

Reasoning from their histological structure, and by exclusion, it seems not improbable that these glands are renal in their nature and homologous with the green glands of the normal Crustacea.

They seem also homologous with the organs described by M. A. Giard in the *Rhizocephala*, and said by him to be "situated on each side of the middle part of the animal, and generally colored yellow or red (primitive kidneys?)." *Annals and Mag. N. H.*, Nov., 1874, p. 383.

I may add that all these observations were made on living *Lim-*

ulus Polyphemus, in the laboratory of the Anderson School of Natural History at Penikese Island, Mass.—A. S. PACKARD, Jr.

BIRDS BREEDING ON PENIKESE ISLAND.—The following birds have been observed by me, breeding upon the island during the summer months of July and August, 1873, and '74.

*Hirundo horreorum* Wils. Barn swallow. Several nests have been found in the barn and beneath several old sheds, and may be called common.

*Petrochelidon lunifrons* Cab. Cliff swallow. One nest found on the outside of an old shed. Rare.

*Cotyle riparia* Boie. Bank swallow. A small colony on the northwest side of the Island in a small sand bank. Common or not rare.

*Passerculus Savanna* Bon. Savanna sparrow. Found breeding on the ground all over the Island. Common.

*Poecetes gramineus* Bd. Grass finch, bay-winged bunting. Several nests have been taken. Not common but may be found more abundantly.

*Melospiza melodia* Bd. Song sparrow. Several nests have been found. Not rare.

*Agelaius phoeniceus* Vieill. Red-winged blackbird. Nests in the sedge grass, not very abundant, on the north shore of the larger Island. Not rare.

*Sturnella magna* Vieill. Meadow lark. Breeds in the fields of the larger Island in several places. Common.

*Tyrannus Carolinensis* Cuv. Kingbird, bee martin. One nest of four eggs was found by me in the bow of an old sail boat on the north side of the island in 1873; have seen none since.

*Tringoides macularius* Bon. Spotted sandpiper. A few pairs have been found breeding along the shores and in the grass near the shore. Common or not rare.

[*Tachycineta bicolor* was found breeding on the island in the summer of 1873, by Mr. A. S. Scott, as we are informed by Mr. C. O. Whitman.—Eds.]

*Sterna hirundo* Wils. Wilson's tern. Breeds abundantly all along the shores and in the grass near the shores.

*Sterna paradisea* Law. Roseate tern. Breeds with the former, but perhaps not quite so abundantly, but both breed by hundreds, though they are fast leaving for more secure quarters.

*Sterna superciliaris* Vieill. Least tern. I add this on the authority of Mr. C. O. Whitman by whom a young bird was found, probably bred here in former years.<sup>1</sup>

Other forms may possibly be found, though owing to the smallness of the island I rather doubt it.—W. STEARNS.

PRAIRIE MICE.—Last fall, some boys out hunting, for lack of larger game, chased some prairie mice into an old stump. With the aid of the dog the stump was quickly demolished, exposing the winter quarters of some eight or ten mice. Two of the little fellows were captured alive; tied into a mitten and brought to me. They were placed in a tin box; in the evening the box was set on the table and the cover removed. The mice soon became so tame that they would leave their box, play over the table and take morsels of food from our hands; but they would never allow us to catch them. In fact that seemed an impossibility, although often attempted; our hands would invariably be found empty and the mice sitting on the opposite side of the table coolly washing their hands, seeming to enjoy our discomfiture. These mice had eyes and ears much larger than those of the house mouse; the hair on the throat, abdomen and feet, pure white. Their motions were all exceedingly quick, they never walked but darted or jumped from one position to another. When performing their ablutions their comical appearance invariably excited laughter; one little paw would be moistened and drawn over the ears and face, so rapidly that it required sharp eyes to follow the motion, the other paw alternating till a satisfactory state of cleanliness was obtained. As a final touch to the toilet, the long, slender tail, was switched through the mouth from base to tip with lightning speed.

I observed one habit in our mice that I do not remember to have seen noticed before in any of the Muridæ. When frightened they would make a clear, quick, rattling noise, by alternately lifting their fore feet and vibrating them against whatever they were resting on. Occasionally a loosely folded paper was laid on the table for the mice to hide in; they sprung their rattle much more frequently when on the paper than when hiding behind books on the table; probably because they found the paper a better medium of sound than the solid table with its cloth cover. In a

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<sup>1</sup> There were some twenty pair of this bird there last summer breeding.—T. M. B.

hollow log or stump, this noise probably proves an effectual means of communicating alarm to each other. After keeping our pets about three months they escaped from us; we never knew how or where; the lid was pushed from the box and they were gone.—J. M. MILLIGAN.

BEARS, ETC., IN ARIZONA.—In Dr. Coues' article on "The Quadrupeds of Arizona" (AM. NATURALIST, vol. 1, No. 7, p. 354), I find but two species of the Ursidæ mentioned as residents, and one *variety*, *U. horriæus*, as extending into Mexico. While attached to Lt. Wheeler's Expedition as Naturalist in 1871, I saw large numbers of bear skins amongst the Coyoté Apachés, then living at Camp Apaché in Eastern Arizona.

Black skins appeared most abundant, next grizzly, and occasionally that of the cinnamon bear. The latter hides were in such bad condition that I declined trading for them, although half a pound of "Army plug" would have secured one.

The Indians, as well as the officers at the Post, informed me that bears were abundant in the Mogollon Mts., but the former seldom attack a grizzly. Dr. Soulè, Post Surgeon, said, that while taking a horse-back ride up the wooded banks of the Rio del Sal one day, he suddenly came upon four large grizzly bears, and as they did not show any disposition to leave, he suddenly retraced his tracks to the Post. One large bear, of the same species also, upon another occasion had the curiosity to cross the ravine and go about the parade ground, until fired at by the sentinels, when he trotted off, threw himself over the precipice (on the river side of the post) into the water, swam across and disappeared amongst the pines.

At Bill Williams Mt., we shot one grizzly, and found numerous tracks around the springs. Wild Turkeys were occasionally seen, and as we approached Postal's Rancho, about twenty miles north of Ft. Whipple, we saw and chased several herds of Antelope. While in the mountains we also obtained five specimens of *Cervus macrotis* Say, which appeared rather abundant. There is another mammal, the beaver (*Castor Canadensis* Kuhl.), quite abundant near Camp Verde. Five miles northeast of the Post, Beaver creek contains numerous dams, and colonies of these animals and many pelts are annually collected, though a few years will suffice to exterminate a race, covering so small an area, and hemmed in by waterless deserts and rocky cañons.—W. HOFFMAN, M.D.

ALBINO FISHES.—Two interesting cases of albinism in fishes have recently fallen within my observation. The first was a specimen of the common haddock (*Melanogrammus æglefinus*), taken off Barnegat, N. J., May 7th, by the schooner "White Cloud," of New London, and shown to me by my friend, Mr. Blackford, of Fulton Market, New York. This fish, which was thirty-one inches long, was normal in every particular except in color. Its general hue was pinkish-white, with a pearly lustre, instead of the usual brownish-gray. The back and top of the head were slightly darker, approximating a very light salmon color. The black stripe which usually marks the lateral line and the blackish-brown blotch, behind and above the pectorals—the traditional mark of the thumb of the disciple Peter—were entirely absent. The fins throughout were yellowish white with a tinge of red, except the ventrals which were a shade darker. The slightest trace of the normal ashy tint of the belly might be discovered just below the origin of the pectorals.

The second instance is a specimen of the common eel (*Anguilla Bostoniensis*) taken in salt water at Noank, Conn., in December, 1874, and presented to the U. S. National Museum, by Capt. Elihu Potter. In this the color is a dull, pale yellow above, becoming nearly white beneath.

According to M. Dareste albinism is not uncommon among European eels. It appears, however, to be very exceptional in our waters. I have never seen or heard of an instance besides the case just cited. True albinism is especially uncommon among the members of the family to which the haddock belongs. The ground color of the cod and haddock varies much with the bottom on which they are taken, but I have never known of a case in which the spots and other markings were obliterated. A familiar instance of the influence of the color of the bottom is found in the rosy "rock-cod" of the coast of Maine, which is usually taken in the neighborhood of ledges covered with the bright red algæ such as *Ptilota serrata* and *Delesseria sinuosa*. In a similar manner the "butter-fish" (*Enneacentrus ouatalibi*) and the "grouper" (*Epinephelus fasciatus*) are influenced by the white coral-sand bottoms about the Bermuda Islands, but though they assume a very pallid hue, the character of their markings is quite unchanged.—G. BROWN GOODE, *University Museum, Middletown, Conn.*



[In the Fish collection of the Peabody Academy of Science there are examples of both of the above mentioned albinos. The haddock, agreeing with the description given by Prof. Goode, was taken off Newburyport some years ago, and sent to the Museum by Mr. Johnson of that place. The "white" eel was collected under the following peculiar circumstances: During the severe gale of Nov. 7, 1865, in Mass. Bay, a small *Cyclopterus* (lump fish) and the eel were washed aboard the schooner "Hero," Capt. Small, who found them on his deck after the gale and brought them to the Museum on his arrival at Salem the next day.—F. W. P.]

CHLORAL AS A PRESERVATIVE.—As it is very desirable that a substitute for alcohol be found for the purpose of preserving specimens, we copy the following from the New York "Tribune," trusting that trials of the experiment will be reported.

The "Philadelphia American Times" contains an article by Dr. W. W. Keen upon the anatomical, pathological, and surgical uses of chloral, in which he recommends this substance very strongly for the preservation of objects of comparative anatomy and natural history. It is used by injection into the blood vessels, or by immersion, and in his opinion it is likely to supersede many of the preparations now in use. Its special advantage is that the color of the object is preserved perfectly, and all the parts have a natural consistency, while there is nothing either poisonous or corrosive to affect the general health of the experimenter or to injure instruments.

For preserving a subject for dissection, half a lb. of chloral will suffice at a cost of a dollar or less. A solution for preserving specimens of natural history of ten or twelve grains to the ounce of water is quite sufficient, is much cheaper than alcohol, and the bottles instead of being hermetically sealed are closed by glass stoppers, or even ordinary corks. Dr. Keen has thus kept pus from various substances, and diseased growths of various kinds of other specimens for months, and found no change whatever in their character. Chloral is extremely antagonistic to fungi and infusoria, a very weak solution of it killing them instantly.

Theodorizing as well as the antiseptic properties of chloral are equal in Dr. Keen's opinion to those of any substance now known.

EXTRAORDINARY ALTERNATION OF GENERATIONS. — *Leptodera appendiculata* lives in *Arion ater* as larva (mouth and vent closed; tail with two long cuticular bands). If the snail is laid in water, or stimulated forcibly to muscular contractions, these small nematoids are expelled in great numbers, and rapidly develop in the water or any slimy substance; the bands are lost, mouth, genital orifice and vent become opened through the casting off of the entire cuticle, generative elements are developed and copulation takes place. The rapidly developing embryos do not attain the size of the parasitic generation, want the bands, and are in other respects unlike, but adopt the characters of the genus *Rhabditis*. They do not need any change of condition for attaining sexual maturity; they copulate, produce a third generation, etc. In this manner an indefinite series of generations may follow, until the nutritive substance is exhausted, when encystation takes place. The migration into the snail and the presumed transformation into the *Leptodera*-form of these encysted *Rhabditis* worms, was not observed. Between male and female individuals of the *Leptodera*- and *Rhabditis*-generation, no copulation will take place. There is some analogy (in spite of the great difference) between this extraordinary "alternation of generations" and that of *Ascaris nigrivenosa* Claus. — *Zoological Record* for 1872.

A TACHINA PARASITE OF THE SQUASH BUG.—It appears that the squash bug (*Coreus tristis*) is frequently infested by a maggot, the larva of a Tachina fly, as numerous specimens have been taken from the bodies of the males by Mr. Knollen, to whom we are indebted for specimens. The larvæ are very large, one specimen only occurring in the body of the *Coreus*, which seems apparently healthy, and performs its sexual functions in spite of the presence of so large a parasite. They are seldom found in the Hemiptera, though *Pentatoma* has been attacked by them.

DOUBLE MONSTERS.—M. Dareste, in reply to the discussion which his paper on double or twin monsters (as given in a former number) had called forth, explains the nature of the observations on which his deductions were based. It would appear that after submitting nearly 8,000 hens' eggs to the process of artificial incubation, he obtained nearly 4,000 anomalies or monstrosities, but of these only about thirty were double embryos or twin monstrosities. A similar result has been observed in the case of osseous

fishes; and Jacobi, who was the first to discover (in the course of the last century) the mechanism of fecundation among these fishes, had noted the proportion of twin monsters in fishes' eggs. His observations and those of Lereboullet coincide with the result obtained by M. Dareste, that while external conditions may often determine the formation of simple monsters, they are absolutely without effect in regard to the evolutions of double monstrosities. — *Nature*.

IMPORTATION OF USEFUL INSECTS.—At a recent meeting of the London Entomological Society, Mr. Dunning stated that he had received a communication from Mr. Nottidge, of New Zealand, asking if it were possible to send over humble-bees, in order, by means of cross fertilization, to procure seeds from clover, which plant remained infertile in the colony, failing suitable insect agency to aid its fertilization. It was suggested that by procuring a sufficient number of humble-bees when in a dormant condition, and keeping them in that state (by means of ice) during the voyage, the result might be obtained. Mr. McLachlan mentioned that he had received a letter from Capt. Hutton, from the same colony, stating that indigenous *Aphides* did not, apparently, exist there, but imported species were becoming very destructive, and he asked if it would be possible to import *Chrysopa*.—*Entomologist's Monthly Magazine*, Jan., 1874.

NESTING OF THE PRAIRIE WARBLER IN NEW HAMPSHIRE.—I obtained in northern New Hampshire, at the latitude of Mt. Washington ( $44\frac{1}{2}^{\circ}$ ), a nest of the prairie warbler, containing four eggs, which differ from all other specimens that I have ever seen. It is also a summer resident there, though Lynn, Mass., in  $42\frac{1}{2}^{\circ}$  latitude, has hitherto been generally accepted as the northern limit at which this bird breeds.—H. D. MINOT.

### GEOLOGY.

ELDEN HOLE, DERBYSHIRE.—We copy the following abstract from "Nature" of a paper read by Mr. R. Pennington before the Literary and Philosophical Society of Manchester, Jan. 26, as of interest in its bearing upon the formation of similar so-called bottomless pits in this country.

"Near the road from Buxton to Castleton, and about four miles from the latter place, stands Elden Hill, in the side of which is